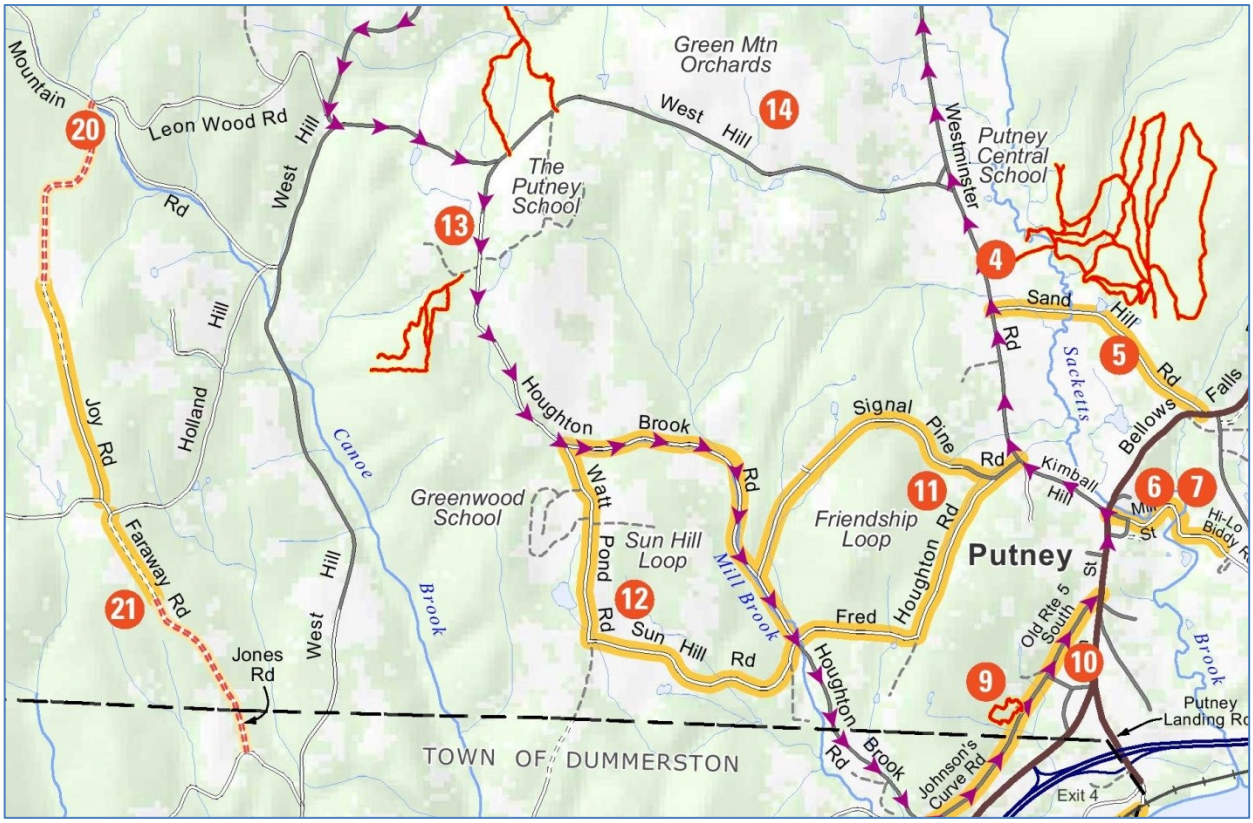
2015 Annual Report



Vermont Center for Geographic Information
and the
Vermont Geographic Information System

Vermont GIS 2015

Annual Report of the Vermont Center
For Geographic Information, Inc. (VCGI)
and the
Vermont Geographic Information System (VGIS)

January 2015

For
Governor Peter Shumlin
And
Vermont House and Senate
Appropriations Committees

Provided By the
Vermont Center for Geographic Information

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Cover Graphic Provided by Jeff Nugent, Windham Regional Commission: The graphic is an excerpt from the cartographic representation of the Putney Trail Guide, August 2014. The Putney Trail Guide was created by Jeff Nugent and graphic designer Susan Kochinskas

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January 15, 2015

Honorable Peter Shumlin
The Statehouse
Montpelier, VT 05602

Dear Governor Shumlin;

This past year brought significant change to the Vermont Center for Geographic Information. Act 179, passed in the spring 2014 legislative session, transitions VCGI to become a Division within the Agency of Commerce and Community Development. VCGI, as a non-profit corporation, will cease operations on March 30, 2015. On or before that date responsibility for VCGI's mission will transfer to the Agency of Commerce and Community Development. This change presents an ideal opportunity to re-engineer the Center for Geographic Information to meet the challenges of the future.

The state of Vermont is nationally recognized for both its geospatial coordination activities and the availability of a broad range and depth of geospatial data. In addition, geospatial technology is a rapidly expanding business area with new demands developing every year. I am certain the Agency of Commerce and Community Development will succeed in taking the state's geospatial technology coordination to the next level.

It's important for me to recognize the staff of VCGI for their tremendous efforts in 2014. Even with significant uncertainty regarding the future disposition of the organization these past two years, the staff of VCGI remained focused on accomplishing the mission of the organization. VCGI staff deserves recognition for the success of the organization, but it is the involvement of the entire GIS community that makes the state's accomplishments in GIS so exemplary. This Annual Report provides a broad cross-section of the accomplishments and activities of VCGI and members of the larger geospatial community.

Back in 1992 the state made an unusual decision in creating VCGI as a state non-profit corporation. I believe the organization's past accomplishments show it was a decision that has paid off in many positive ways over the years. Now is clearly the time for the state to bring its geospatial coordination capacity back inside state government. I fully expect this decision will also pay off in many positive ways in the future.

Thank you for your support of VCGI and its mission.

Sincerely,

David F. Brotzman
Executive Director
davidb@vcgi.org

VERMONT

Agency of Commerce and Community Development
National Life Building – North, 6th Floor
One National Life Drive
Montpelier, VT 05620-0501
accd.vermont.gov

[phone] 802-828-3211
[fax] 802-828-3383

January 15, 2015

Honorable Peter Shumlin
The Statehouse
Montpelier, VT 05602

Dear Governor Shumlin;

We are pleased to welcome the Vermont Center for Geographic Information into the Agency of Commerce and Community Development. This integration will result in mission and capability synergies for both VCGI and ACCD.

We look forward to leading and advancing the coordination of statewide geospatial data and believe the role of geospatial information within state government, and statewide, is virtually limitless. ACCD is excited to meet this important new challenge with the addition of the VCGI staff into our exceptional team.

Sincerely,

Lucy Leriche
Deputy Secretary
Agency of Commerce and Community Development

TABLE OF CONTENTS

This report could not have been prepared without the comments and contributions of the Vermont GIS community, including Vermont's regional planning commissions, commercial GIS firms, and numerous state and federal agencies. I would also like to acknowledge the VCGI staff for their assistance in the production of this document.

David F. Brotzman, Executive Director

I. 2014 - Year in Review

a. State Activities

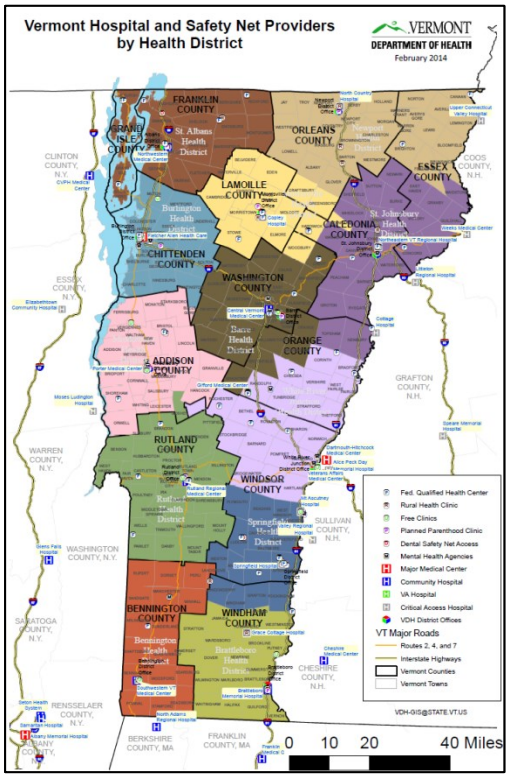
The following State Activities section provides a sampling of the geospatial activities of members of the VGIS community that want to showcase their activities from the past year.

VT Department of Health – Provided by Pete Young, VDH

The Vermont Department of Health (VDH) uses GIS technology for a variety of public health purposes, including public health surveillance, public health planning, health data reporting, and emergency preparedness. Currently, VDH has approximately 25 staff using GIS technology at levels ranging from basic map-making to sophisticated geographic analysis to web application development. VDH GIS activities are coordinated by a department GIS Manager who works closely with a half-dozen department staff who are advanced desktop GIS software users and with appropriate IT staff, including the Systems Developer who administers the department's web GIS infrastructure and two Database Administrators (DBAs) who administer the department's SQL-Server GIS databases.

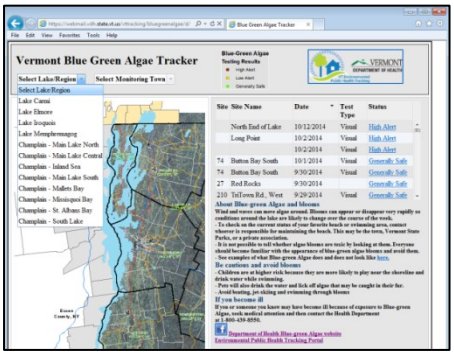
Day to day public health GIS work typically involves developing/maintaining GIS data and using that data to support public health programs by performing spatial analyses or creating map products. Map products are deployed as stand-alone maps, as maps embedded into reports, or as maps deployed to the web (internally or publicly).

This 2014 example of a stand-alone map (on right) shows the statewide locations of different types of hospitals and safety net providers:

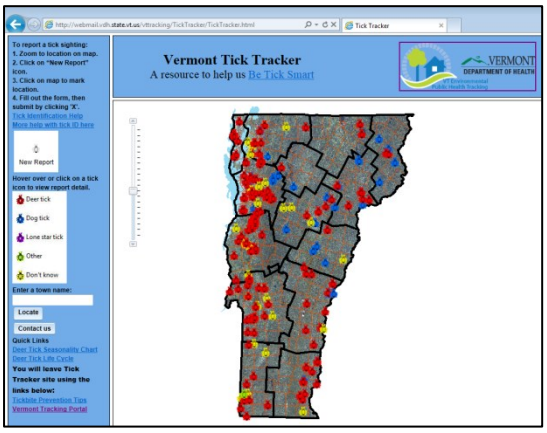


Several new public health GIS resources were updated or added to the public-facing VDH [healthvermont.gov](www.healthvermont.gov) website during 2014, including:

- The VDH GIS landing page (www.healthvermont.gov/GIS), which briefly describes public health GIS activities at VDH and identifies department programs that make active use of GIS technology.



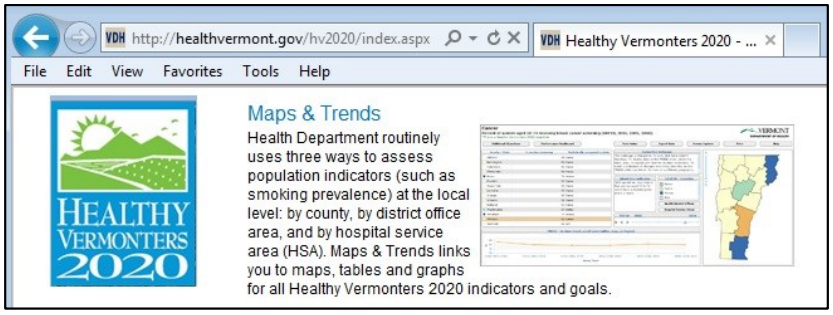
- The Blue-Green Algae Tracker, improved from 2013, reports blue-green algae weekly testing results for Lake Champlain and five inland lakes that are collected by the Department of Environmental Conservation, VDH, and the Lake Champlain Committee: https://webmail.vdh.state.vt.us/vttracking/bluegreenalgae The 2012, 2013, and 2014 testing results will remain accessible as archived seasonal summaries. This application may be expanded in the future to include other frequently visited lakes and ponds across the state.



- The Tick Tracker interactive web map (http://healthvermont.gov/ticktracker) allows website visitors to report observed tick conditions and to see the reports submitted by others. The web map also provides links to important educational information that can help people "Be Tick Smart".

- The Vermont Environmental Public Health Tracking (EPHT) portal features map-driven dashboard data reports. The portal has grown to include over 200 data measures that are accessed using an interactive query tool that serves the dashboard-styled reports. Search for Vermont Tracking data reports by browsing to www.healthvermont.gov/Tracking and clicking on "search data".

- The Healthy Vermonters 2020 webpage (www.healthvermont.gov/hv2020) continues to expand the availability of map-driven dashboard data reports. People can visit the HV2020 webpage to see maps and trend data for nearly 200 indicators by county, health district, and hospital service area. These indicators have been identified as public health priorities and are accompanied by targets that will guide the work of public health in Vermont through 2020.



In addition to public health GIS resources that are available to the public, VDH maintains a variety of internal-use-only (restricted) GIS web resources for VDH and other Vermont State Staff. These include web base-maps that support emergency preparedness/response work and local/rural health work.

Public health GIS activities span many different areas of expertise. Looking to the future, public health GIS activities at VDH will involve an increasing number of web applications, both PC and mobile-device based, that display maps and location-specific data.

VDH GIS Point of Contact: Pete Young, GIS Manager - Peter.Young@state.vt.us
Vermont Department of Health - www.healthvermont.gov/GIS

VT Transportation Department – Provided by Johnathan Croft, Rick Scott & Kevin Viani, VTrans

Vermont's Transportation data layers consist of road centerline, railroad, bridge, airport, small culverts, and other transportation assets, as well as transportation related metrics including traffic volume, crash locations, pavement condition, and others. GIS data layers are integral to the internal workflows of the Agency and are continuing to expand in mapping, right of way, asset management, project development and the visualization of the overall assessment of the transportation infrastructure. Over the course of the last year, more emphasis has been put on the deployment of web maps of infrastructure condition, closure status, planned projects, and maintenance, all providing the public direct access to information that had typically difficult to access or visualize.

VTrans Pavement Condition & Paving Projects

The quality and currency of transportation data overall in Vermont continues to be high and is ever improving. The Agency of Transportation (VTrans) and the Enhanced 911 Board (E911) continue to work together to merge each organization's road centerline data layer into a single master, and have implemented a common data schema that includes data fields that supports both organizations missions. Both organizations are also working on reconciling town boundary data and having a common town boundary data.

VTrans continues to support the statewide LiDAR acquisition and parcel mapping efforts by providing resources to both of these initiatives. This includes working with a contractor on the Return on Investment Study for the statewide parcel mapping.

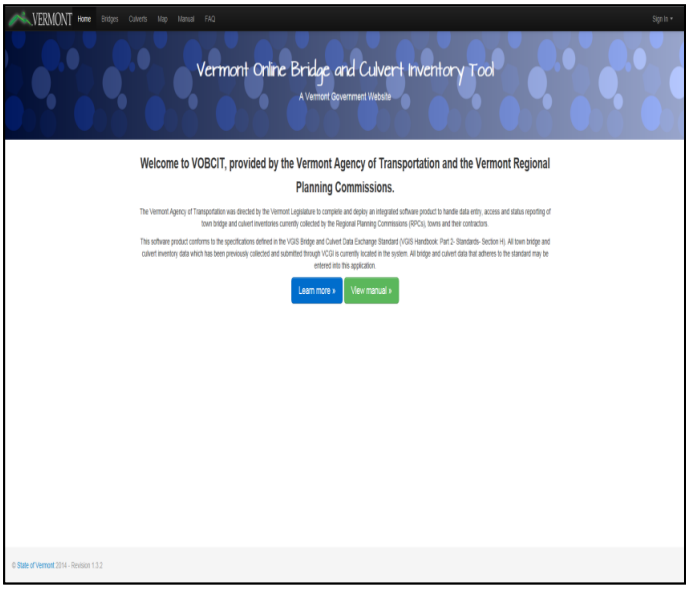
The transportation data for Vermont continues to be in good condition. VTrans has maintained and improved an accurate, robust, and up-to-date repository of data. This data is becoming essential for standard business functions and relied upon by many Sections throughout the Agency. VTrans continues to collaborate with State Agencies in the development and sharing of GIS data.

Vermont Association of Planning and Development Agencies (VAPDA) – GIS services for FY-2014- Provided by Daniel Currier, CVRPC

Vermont's eleven Regional Planning Commissions under the direction of our Directors and our yearly work plan with the Agency of Commerce and Community Development provide GIS services to the

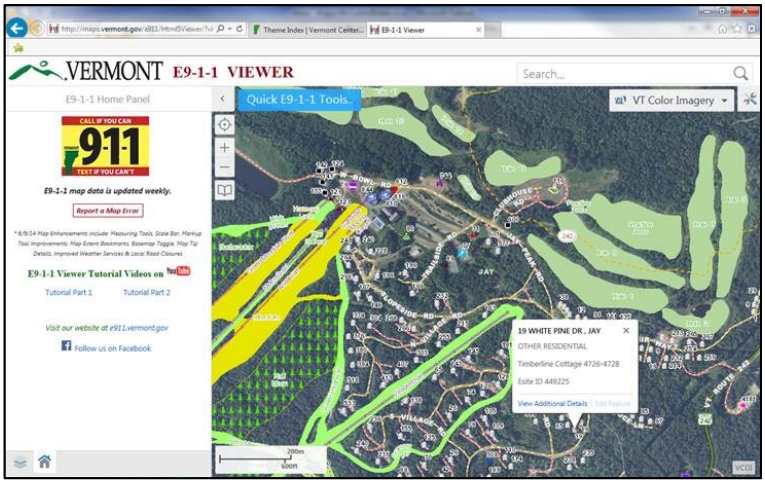
municipalities and their commissions and committees. Below is a snapshot of the projects and services that the RPC's have accomplished during FY-2014.

- RPC staff has provided assistance to the state wide LiDAR working group on the acquisition of LiDAR data. We participated in the selection of the State LiDAR acquisition areas and securing funding for priority areas.
- Provided mapping assistance to municipalities seeking or renewing their Village Center, Downtown, New Town Center, or Growth Center designations.
- Developed maps for municipal plan updates based on the requirements of Chapter 117 and zoning bylaw revisions.
- Participated in the development with VT Department of Forest, Parks, and Recreation of a web-based mapping tool for landscape scale forest stewardship data.
- RPC staff with funding from VTrans Transportation Planning Initiative (TPI) inspected and mapped town bridge and culvert locations and uploaded that data to the VT Online Bridge and Culvert Inventory Tool. https://www.vtculverts.org/



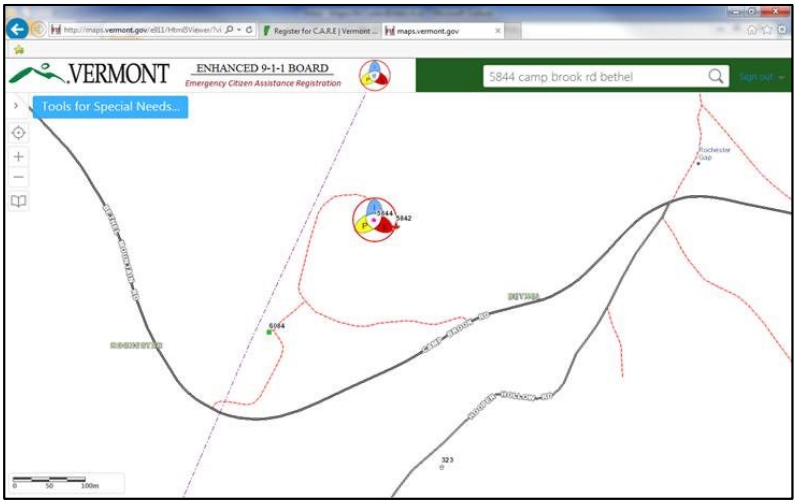
VT Enhanced 9-1-1 Board – Provided by Angus McCusker, VT E9-1-1

The Enhanced 9-1-1 Board has had a busy year! The E9-1-1 Database Department heavily uses GIS technology to manage Vermont's statewide E911 datasets. The database team includes Jeremy McMullen, Angus McCusker, Tyler Hermanson and Karen Rielly. Datasets are updated on a daily basis and are used by 9-1-1 call-takers, dispatchers, responders, E9-1-1 coordinators and town officers around the state.



E9-1-1 continues to improve its new mobile device friendly web maps including the E911 Viewer, E911 Responder and C.A.R.E. sites. E911 viewer and E911 Responder are both popular public facing maps that dispatchers and responders use on a regular basis when responding to a 9-1-1 call or text.

The CARE Program (Citizen Assistance Registration for Emergencies) was fully rolled out on a statewide level. CARE is administered by the United Ways of Vermont, Vermont 2-1-1 and Vermont E9-1-1. All three parties are working together to identify Vermont residents who would require special assistance in an emergency. E9-1-1 provides the back end mapping tools for United Ways and Vermont 2-1-1 officials to keep Vermont's CARE data up to date.



E9-1-1 also continues to be involved with the Enterprise GIS Consortium (EGC) work group and has been providing EGC partners and VCGI with updated E9-1-1 datasets for public consumption.

E911 Viewer - http://e911.vermont.gov/maps/e911viewer

b. VCGI Activities

I. VCGI Data, Community and Project Related Activities

Participation in the National and Regional GIS Community
The Executive Director of VCGI, David Brotzman, served on the Board of Directors of the GIS Certification Institute (GISCI). The GIS Certification Institute (GISCI) is a tax-exempt, not-for-profit organization that provides the international GIS community with a GIS certification program. GISCI is the leading GIS certification opportunity for the broadly defined GIS profession. Certified GIS professionals (GISPs) must show proficiency in three areas to be awarded certification; 1.) Educational Achievement, 2.) Professional Experience, and 3.) Contributions to the Profession.

Steve Sharp, Director of GIS Enterprise Services at VCGI served as Immediate Past President of the New England Chapter of the Urban & Regional Information Systems Association (NEURISA) in 2014. NEURISA is a professional organization that provides a forum for: promoting and facilitating the use and integration of spatial information technology, fostering relationships, professional development, and representing the interests of Geographic Information System (GIS) practitioners and Information Technology professionals across the New England region.

Steve Sharp, Director of Enterprise GIS Services

Vermont's Enterprise GIS Consortium (EGC)
The EGC had another productive year, continuing efforts to foster efficient and effective use of the State's geospatial resources. The EGC made headway in a number of areas including revisions to its Web Services Strategy, and the establishment of three workgroups addressing the 1) creation of a new VT Open GeoData Portal, 2) statewide Parcel data, and 3) improved use of GIS resources in support of emergency response activities.

The EGC is a voluntary consortium of state government organizations focused on effective management of State's Enterprise Geographic Information System (GIS). The EGC was chartered[1] by the State of Vermont in August 2008, culminating a yearlong strategic planning effort managed by the Enterprise GIS Taskforce[2] (EGT). The EGC has established a realistic and effective Enterprise GIS Strategic Plan[3] (referred to as the *Plan* herein); a vision and a plan that supports a wide range of needs within and outside of state government. The Plan is an important part of the state's '*comprehensive strategy*' for the development and use of Vermont's Geographic Information System (VGIS)[4]. The VGIS represents a broad spectrum of geospatial activities and constituencies throughout the state of Vermont, including academic, town, regional, non-profit, state, private sector, and the general public. The Plan articulates a strategic vision for the development and use of geospatial technology within state government; a critical component of the VGIS.

[1] EGC_Charter_2008A_final.pdf
[2] The EGT has been replaced by the EGC.
[3] EnterpriseGIS_SP_v2008A.pdf
[4] Vermont Statute (Title 10 VSA - Chapter 8 § 121)

FY'2014 Accomplishments

1) **Vermont Enterprise GIS Consortium (EGC):** The EGC held monthly meetings throughout FY 2014. This allowed the EGC to maintain momentum on a number of work items identified in the FY 2014 Business Plan[5]. EGC member participation has been steady.

2) **Parcel Workgroup:** A Parcel Workgroup was established in 2014. The Workgroup held periodic meetings focused on facilitating the goal of creating and maintaining a consistent and up-to-date statewide parcel layer for VT. The Workgroup is working with VTrans on a Return on Investment (ROI) analysis that will look at potential organizational arrangements that would support a statewide parcel data program. VCGI also received a grant from the Northern Borders Regional Commission (NBRC) to support the creation and/or update of parcel datasets for fourteen towns in the NB region. The results of the NBRC project will help inform the Parcel Workgroup's efforts.

3) **Emergency Management Workgroup:** An Emergency Management Workgroup (EMW) was established under the EGC to create GIS capabilities and procedures that improve the use of GIS technology which supports State of Vermont Emergency Management planning and response activities. The Workgroup had a successful kickoff meeting, and has identified a number of work items in support of its goals and objectives.

4) **Geocortex Workgroup:** Five agencies (ANR, AHS, E911, VTrans, and VCGI) continued to share hardware and software used to support the State's Geocortex Essentials interactive mapping platform. This enterprise application has allowed these agencies to develop and maintain interactive mapping platform that meet the specific needs of their target constituencies. In 2014 the Workgroup agreed to purchase their own technical support "hours" from Latitude Geographic (the company that makes Geocortex Essentials). The Workgroup also successfully upgraded both the development and production systems to the latest version of the software.

5) **Open Data Workgroup:** The EGC established the Open Data Workgroup (formerly called the Data Warehouse Workgroup) and directed it to work with VCGI to redesign and rebuild the State's Open GeoData Portal. The Workgroup
    i) Drafted and ranked requirements (user stories) for a new VT Open GeoData Portal.
    ii) Tested several platforms that could be used to build and deploy a new Portal.
    iii) Drafted, released, and received responses to a "VT Open Data Portal" RFI (Request For Information).

    The release of an RFP has been put on hold pending a decision by VCGI, ACCD, and EGC representatives.

6) **GIS Careers in State Government**: As part of the IT reclassification analysis for all of state government, EGC representatives proposed a GIS track that expands the current GIS-specific positions in the state job classification system. The proposed GIS track includes 3 tiers similar to the tiers used for all other IT tracks. The EGC began to craft job descriptions. EGC representatives will continue to work with the Department of Human Resources to move this proposal toward implementation.

7) **EGC SharePoint site:** The EGC's SharePoint portal (EGC GeoPoint GIS Portal) was maintained and used throughout FY'2014 to share data and documents. A new sub-site was created for the Parcel Workgroup where all meeting minutes and other relevant documents are posted. The EGC's

[5] EGC_BusinessPlan_FY2014_final.pdf

SharePoint site supports EGC activities, and acts as a central reference point for EGC documents and resources. The site is available to State employees, EGC stakeholders, and the public.

8) **Revised Web Services Strategy:** The EGC revised the Web Services Strategy and released a version 2.1 in January 2014. This revision addressed version naming, life cycle policies, https/ssl, service maintenance, ArcGIS Server upgrades, ArcGIS Online strategy, and included some new EGC web services.

VCGI Web Map Services
VCGI continues to host and maintain several web services that help State government partners (eg: EGC partners) and Vermonters with their mapping efforts. These include the VT GIS Basemap service, cached imagery services, and address geocoding service. VCGI has developed this suite of web services in coordination with our EGC partners, and has worked to align it with the EGC's Web Services Strategy. These services are used in a number of state web applications including but not limited to;

- Vermont Interactive Map Viewer
- ANR Natural Resources Atlas
- VT BioFinder
- E911 Map Viewers
- Vermont Tick Tracker (VT Department of Health)

VCGI hosted web map services are also used by public and private constituents who need them to streamline the work they do. For example, VCGI cached imagery services eliminates the need to download thousands of VT orthophoto image tiles. Instead the user can "stream" the imagery into their web browser or mapping software, saving countless hours downloading and organizing the imagery.

Mike Brouillette, Web Applications Administrator - State LiDAR Coordinator

Vermont LiDAR Initiative
In pursuit of its goal for statewide high resolution elevation data coverage, the "Vermont LiDAR Initiative" (VTLI), in coordination with federal agencies, helped secure funding for an additional 2,534 square miles of Quality Level 2 (QL2) data in 2014. Combined with the 1,600 square miles of QL2 data secured in 2013 this leaves only 30% (2,850 sq. mi.) of the state outstanding with an additional 7% (Essex County - 675 sq. mi.) of the state in need of updating. Finally, initiative members worked collaboratively to submit a final proposal to the USGS Broad Agency Announcement (USGS BAA) in early December following acceptance of a required pre-proposal. If successful, the funds secured by members would leverage matching USGS funds to collect an additional 1,100 square miles of QL2 data capable of supporting 1' contours and 0.7m resolution elevation products.

The VTLI is an official project of the EGC LiDAR Workgroup to support the coordination, acquisition and dissemination of the statewide elevation model based on Light Distance and Ranging (LiDAR) technology. Supporting the initiative is a clearinghouse web page (vcgi.vermont.gov/lidar) that contains the state LiDAR plan, an informational brochure and other education and advocacy resources. The plan defines a set of actions required to acquire LiDAR data and derivative products that are of sufficient design, accuracy, consistency, coverage and resolution to meet the business needs of the broadest possible user community in the state.

The workgroup is comprised of federal, state and local partners, each advocating for this effort within their organizations and in the public arena as opportunities arise. As the state GIS coordinating

organization, VCGI has committed to the success and long-term support of this effort by designating a staff state LiDAR coordinator role. In the broader context, existing and future data from this program will be shared on both the VGIS and appropriate federal data portals to ensure the public, hazard mitigation, emergency, public safety and other critical state interests have multiple access points.

State LiDAR Coordinator (Vermont LiDAR Initiative)
The coordinator role has a wide range of responsibilities related to all aspects of facilitating data acquisition, data dissemination, coordinating workgroup meetings and agendas, facilitating implementation of the state LiDAR plan and outreach and advocacy efforts in support of the initiatives goal of statewide coverage.

To facilitate outreach and provide a central source of information for the Vermont LiDAR Initiative, the vcgi.vermont.gov/lidar web page was created last year as a central resource for users to find the latest version of the state plan, data status and updates and other supporting information. All of the high priority data layers are now available on the VGIS and attention now turns to developing the web services strategy.

Continuing the need to raise awareness for state support of statewide LiDAR as identified in 2013, VCGI and workgroup members met within their organizations and with a number of state agency heads, related committees and other organizations at the executive level culminating in a high level of support for the USGS-BAA effort.

Vermont Sustainable Jobs Fund – Renewable Energy Atlas
The "Phase IV" scope of work to calculate solar LiDAR potential for all areas of Vermont with LiDAR data availability was postponed until November 2014 and then only partially funded. Fortunately, VCGI was able to produce a "final draft" of the code needed to model this data and there is hope that VSJF will acquire the remaining funding in the New Year to complete the effort. Employing high accuracy Digital Surface Model (DSM) data derived from LiDAR enables the modeling of solar potential on all surfaces while accounting for shading, slopes, average climatic conditions and both time of day and year.

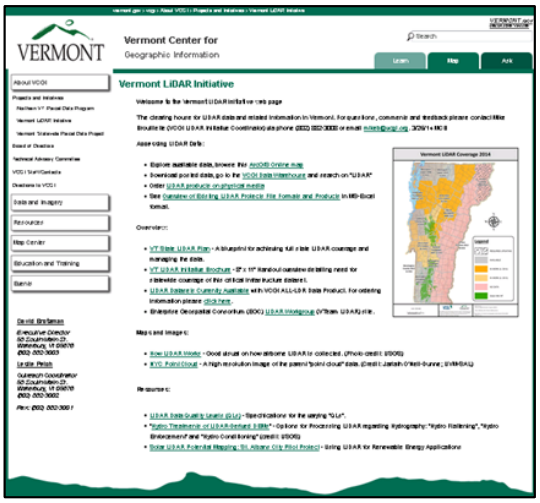
Subject to completion, VSJF will integrate these results with the "Community Energy Dashboard" effort sponsored by the Energy Action Network, an organization based in Montpelier, VT. The publicly available data would allow any business or individual to explore solar potential and to compare actual solar array production numbers with the estimated values.

The solar potential data dovetails well with the dashboards goals of "…to enable communities to understand their energy use and make clean energy choices and investments across all energy sectors: electric, thermal, and transportation." For more information on this effort please see their website - eanvt.org/community-energy-dashboard/.

Web Applications Administrator
Utilizing the States Content Management System (CMS) in coordination with the Web Content Administrator, a number of periodic upgrades to existing VCGI web pages was conducted. In particular, The Vermont LiDAR Initiative web page created last year to act as a clearing house was maintained and updated to keep pace with the ongoing changes to data availability and acquisition efforts (vcgi.vermont.gov/lidar). These efforts will continue in 2015 as additional data becomes available.

Events and Activities in which VCGI Participated in 2014:

- Renewable Energy 2014 Conference and Expo: Community Solutions for Vermont. Sponsored by Renewable Energy Vermont. Networked with vendors and attendees to advocate for LiDAR and the Solar Potential Data.
- Daily support of users increasingly interested in acquiring and using LiDAR based data for a variety of applications. The majority of these inquiries are concerned with data collection timing of outstanding areas.



Dejung Gewissler, System Administrator

NTIA Broadband Grant
In 2009 VCGI, as prime contractor representing the larger team from VT, was awarded Broadband Mapping Grant by NTIA for 3.5M over 5 years. VCGI's partners in this grant are the VT Telecommunications Authority, UVM- Center for Rural Studies, VT Dept. of Public Service and VT E911. There was also a significant role for private sector contractors. The full grant covers broadband telecommunications, data collection, verification, and display for federal fiscal years 2010 thru 2014.

The initiatives that were funded are as follows;

1. Data Collection, Integration, Verification, and Display – Vermont's Broadband Mapping Initiative (BMI) is a collaborative broadband data collection and verification effort involving partners from the public, private and academic sectors. The Team collected broadband availability data from the Providers and from public sources. Broadband availability data was verified by drive testing, field checking, public surveys (offline and online), and through interaction with the providers. Data and broadband related information was made available through the BroadbandVT.org website. The awarded amount for this effort was $1,562,000 over the five year period.

2. Broadband Capacity Building – The Vermont Telecommunications Authority created a position for a Director of Broadband Coordination and Outreach. The Director acted as a liaison between Providers and government and the bodies they serve to instill the broadband vision, preserve its consistency and create an atmosphere of common mission. The liaison was a bridge between state offices and regional planning agencies to convey information in both directions about infrastructure, aggregation, adoption and policy efforts. The Director

accelerated opportunities to achieve the outcomes set forth in the VT Telecommunications Plan. The awarded amount for this effort was $531,900 over the five year period.

3. Regional Broadband Planning - Vermont's participating Regional Planning Commissions (RPCs) developed a network of contacts in communities and local sectors to assess where promising opportunities are available to develop broadband adoption and/or access. Regional Technology Planning Teams were formed to plan and realize these opportunities. Through these partnerships, groups had new opportunities to access various technical assistance programs available for others. The Regional Technology Plan offers the State and other groups a plan for rolling out broadband technologies at the local and regional levels. The awarded amount for this effort was $250,034 over a two year period.

The VT Broadband Mapping Team continues to maintain the BroadbandVT.org (www.broadbandvt.org) website. The contract is now in the final year of the grant.

VCGI Network/System Administration
VCGI has successfully integrated all of our outward facing servers into the virtualized environment and maintains communication with DII through their Footprints ticketing system for maintenance and critical issues. Multiple agencies are using this infrastructure for GIS web services and web application support.

Due to network limitations it was necessary to maintain one private server for use as a file server here on premise. It too has proven successful at increasingly larger files are necessary for processing and with our involvement in data rich projects our data requirements are continually increasing. The server is backed up with an automated tape library system for archive and recovery purposes.

Ivan Brown, Database Administrator

GIS Data Updates
VCGI posted many new and updated data layers to Vermont's Open GeoData Portal during 2014; many of these data layers were provided by partner organizations. We thank our partners for their contributions. The following table lists data layers that were posted during 2014.

Layer Name	Layer Description	Post Date
BoundaryOther_SCHLDIST	VT School Districts	12/16/2014
BoundaryOther_SUNIONS	School Supervisory Union Boundaries	12/16/2014
CadastralParcels_VTPARCELS	VT Parcel data provided by towns and RPCs	8/3/2014
ElevationContours_CN2T	2 ft contours generated from LIDAR - Approx 35 percent of VT	7/22/2014
ElevationDEM_DEM1m	1 meter Digital Elevation Model (DEM), LiDAR-derived	3/20/2014
ElevationDEM_DEM1p6m	1.6 meter Digital Elevation Model (DEM), LiDAR-derived	3/5/2014
ElevationOther_ASPECT1m	1 meter ASPECT, LiDAR-derived	5/1/2014
ElevationOther_ASPECT1p4m	1.4 meter ASPECT, LiDAR-derived	5/1/2014
ElevationOther_ASPECT1p6m	1.6 meter ASPECT, LiDAR-derived	5/1/2014
ElevationOther_DSM1m	1 meter Digital Surface Model (DSM), LiDAR-derived	3/5/2014
ElevationOther_DSM1p6m	1.6 meter Digital Surface Model (DSM), LiDAR-	3/5/2014

Layer Name	Layer Description	Post Date
	derived	
ElevationOther_HILSHD1m	1 meter HILLSHADE, LiDAR-derived	5/1/2014
ElevationOther_HILSHD1p4m	1.4 meter HILLSHADE, LiDAR-derived	5/1/2014
ElevationOther_HILSHD1p6m	1.6 meter HILLSHADE, LiDAR-derived	5/1/2014
ElevationOther_nDSM1m	1 meter nDSM (Normalized DSM), LiDAR-derived	5/1/2014
ElevationOther_nDSM1p4m	1.4 meter nDSM (Normalized DSM), LiDAR-derived	5/1/2014
ElevationOther_nDSM1p6m	1.6 meter nDSM (Normalized DSM), LiDAR-derived	5/1/2014
ElevationSlope_SLOPE1m	1 meter SLOPE, LiDAR-derived	5/1/2014
ElevationSlope_SLOPE1p4m	1.4 meter SLOPE, LiDAR-derived	5/1/2014
ElevationSlope_SLOPE1p6m	1.6 meter SLOPE, LiDAR-derived	5/1/2014
EmergencyE911_ALPINELIFTS	E911 alpine ski lifts data layer	6/23/2014
EmergencyE911_DW	Driveways captured for E911 use	6/23/2014
EmergencyE911_ESA	E911 Emergency Service Agency Locations	6/23/2014
EmergencyE911_ESITE	E911 Site locations (buildings, hydrants, public phones, ..)	6/23/2014
EmergencyE911_ESZ	E911 Emergency Service Zone data layer	6/23/2014
EmergencyE911_FOOTPRINTS	E911 building footprints layer (limited set of buildings)	6/23/2014
EmergencyE911_GDBE911	All E911 data layers in File Geodatabase format (v10.2.2)	6/23/2014
EmergencyE911_HYDRANTS	E911 Fire hydrants data layer	6/23/2014
EmergencyE911_JBOUND	E911 town boundaries data layer	6/23/2014
EmergencyE911_LANDMARKS	Landmarks captured for E911 use	6/23/2014
EmergencyE911_LKUPTABLES	E911 lookup tables - tabular	6/23/2014
EmergencyE911_RDS	E911 Road centerlines from 1:5000 orthophotos and GPS	6/23/2014
EmergencyE911_SHEETS	E911 Atlas Map Sheets Boundaries	6/23/2014
EmergencyE911_TRAILS	E911 trails data layer	6/23/2014
EmergencyFlood_DFIRMC	FEMA Digital Flood Insurance Rate Map data (county-based)	6/30/2014
EmergencyFlood_DFIRMT	FEMA Digital Flood Insurance Rate Map data (town-based)	7/7/2014
EmergencyFlood_VTHWM2011	High Water Marks 2011 - Lake Champlain flooding and TS Irene	10/22/2014
FacilitiesSchools_PTSCHOOL	VT School Locations	12/16/2014
LandLandcov_IMPERVLCB2011	Impervious Surfaces - NY/VT Portions of Lake Champlain, 2011	2/5/2014
NAIP_1M_CLRIR_2012	2012 - Color & Infrared (4 band) - Statewide NAIP (1m)	6/27/2014
TransAir_AIRPORTS	Airport locations in the state of Vermont	3/28/2014
TransRail_RR	Railroad centerlines from 1:5000 orthophotos	3/28/2014
TransRail_RRXING	Railroad Crossings in Vermont	3/28/2014
TransRoad_EROSIONRISK	Potential road erosion locations on unpaved Class 2-4	10/29/2014

Layer Name	Layer Description	Post Date
	roads	
TransRoad_LRS2008	VTrans Linear Reference System (2008)	3/28/2014
TransRoad_LRS2010	VTrans Linear Reference System (2010)	3/28/2014
TransRoad_LRS2012	VTrans Linear Reference System (2012)	3/28/2014
TransRoad_LRS2013	VTrans Linear Reference System (2013)	3/28/2014
TransRoad_RDS	VTrans Master Road Centerline Dataset	8/5/2014
TransRoad_RDSWIDTH2014	Roadway widths on Vermont highways 2014	8/4/2014
TransRoad_RTLOGPTS2010	VTrans 2010 Route Log intersection and LRS calibration pts	3/28/2014
TransRoad_RTLOGPTS2012	VTrans 2012 Route Log intersection and LRS calibration pts	3/28/2014
TransRoad_RTLOGPTS2013	VTrans 2013 Route Log intersection and LRS calibration pts	3/28/2014
TransStats_AADT2013	Average Annual Daily Traffic: 2013 - all routes	8/5/2014
TransStats_HCL20082012	High Crash Locations: 2008 - 2012	3/28/2014
TransStructures_BCVOBCIT	VT Town Bridges and Culverts	10/17/2014
TransStructures_BCVTRANS	VTrans Bridge & Culvert Inventory	8/5/2014
UtilityTelecom_CABLE2013	Vermont Cable Systems 2013 - broadband & cos. w/o broadband	2/11/2014
UtilityTelecom_CABLEMOD2013	Vermont Cable Systems 2013	2/11/2014
VTORTHO_0_15M_CLRIR_2013	2013 - Color & Infrared - most of Chittenden Co. (15 cm)	3/28/2014
VTORTHO_0_15M_PAN_2013	2013 - Black & White - most of Chittenden Co. (15 cm)	4/4/2014
VTORTHO_0_2M_CLRIR_2013	2013 - Color & Infrared - eastern Chittenden Co. (20 cm)	3/31/2014
VTORTHO_0_2M_PAN_2013	2013 - Black & White - eastern Chittenden Co. (20 cm)	4/8/2014
VTORTHO_0_3M_CLRIR_2013	2013 - Color & Infrared - Barre-Montpelier Area (0.3m)	3/22/2014
VTORTHO_0_5M_CLRIR_2013	2013 - Color & Infrared - Northwestern Vermont (0.5m)	2/17/2014
VTORTHO_0_5M_PAN_2013	2013 - Black & White - Northwestern Vermont (0.5m)	2/17/2014
WaterHydro_WBD12VT	VT Subwatershed boundaries (HUC12)	7/10/2014
WaterHydro_WBD8VT	VT Subbasin boundaries (HUC8)	7/10/2014

Vermont Agency of Agriculture, Food, and Markets (VAAFM)

VCGI and the Vermont Agency of Agriculture, Food, and Markets (VAAFM) have continued a service level agreement by which VCGI hosts enterprise GIS databases and web services for VAAFM as needed. VCGI hosts enterprise GIS databases for VAAFM, providing infrastructure for VAAFM's advancement of GIS capabilities. VCGI staff look forward to supporting the continuation of maturation of a robust GIS implementation at VAAFM.

Vermont Division of Emergency Management and Homeland Security (DEMHS)
VCGI continues to have a critical role in the use of GIS technology within the Vermont Division of Emergency Management and Homeland Security (DEMHS). DEMHS relies on VCGI for provision of GIS support in multiple forms, including leadership, training, data development, application development, and staffing the Planning Section GIS Unit during SEOC (state emergency operations center) exercises and activations. With VCGI's support, utilization of GIS capabilities continues to increase at DEMHS.

During 2014, VCGI instantiated a suggestion from staff of Vermont Agency of Agriculture, Food, and Markets (VAAFM) that an EGC (enterprise GIS consortium) workgroup be formed for the area of Emergency Management. Thus, the group of SEOC GIS partners, which includes GIS human resources and stakeholders from state agencies and regional planning commissions, formalized an EGC Emergency Management Workgroup. The workgroup, for which VCGI provides leadership and coordination, has a charter which articulates the following mission.

> *"Create GIS capabilities and procedures that improve use of GIS technology which supports State of Vermont Emergency Management planning and response activities."*

The EGC Emergency Management Workgroup has established goals, which include support to the goals that are set forth in the state's IT and Enterprise GIS plans, guidance to development and utilization of GIS capabilities within the state's emergency management functions, and implementation of an education strategy that informs decision makers on the capabilities of GIS technology and assures that emergency management GIS partners are informed on emergency management business needs. The workgroup realized significant achievements in 2014. It has great momentum toward continuing advancement during 2015.

During November 2014, a consultant was on-site at DEMHS for a three-day SEOC process mapping workshop. VCGI represented GIS technology in that workshop. VCGI assured that GIS elements of processes, tasks, inputs, and outputs were identified.

VCGI has been very active with DEMHS's SEOC Steering Committee. The SEOC Steering Committee has driven the process of configuring a new version of DisasterLAN, which is the State of Vermont's incident/disaster management system. DisasterLAN includes a web mapping component named "Vermont Live", which supports a common operating picture (COP). The committee has also plied a lot of effort toward developing a new high quality DiasterLAN training program, which includes a significant amount of course material contribution from VCGI for the "Vermont Live" component.

During 2014, VCGI continued to advance development of the state's critical facilities GIS database. VCGI supported a web-based data editor that allowed regional planning commissions to relate critical facility locations to E911 address point data. VCGI has continued a dialog with DEMHS on the various sectors of critical infrastructure and how critical infrastructure data can be organized. VCGI staff look forward to continuing support of critical facility data collection and migrating critical facility data to a data model that is most suitable to the state's business needs.
VCGI provided a new edition of the SEOC-GIS manual during 2014. The SEOC-GIS manual provides essential information on GIS resources, standards, and procedures to employees who staff the Planning Section GIS Unit in the SEOC, as well as GIS staff in related state support functions and operations centers. Given that the manual is perpetually in need of updates and revisions, VCGI has begun development of another revised edition of the SEOC-GIS manual; This next edition will include documentation that relates event types (winter storms, floods, Vermont Yankee, etc.) to related data resources (historical ice storm data, flood plains, critical facilities, etc.).

During 2014, VCGI continued to provide GIS staffing to SEOC drills, including a major multi-day drill titled "CAT2", Vermont Yankee drills, and even a GIS-specific drill that was attended by the EGC Emergency Management Workgroup. VCGI is working with DEMHS on a series of HSEEP-guided (Homeland Security Exercise and Evaluation Program) GIS-specific seminars, workshops, and/or tabletop exercises to occur in 2015-2016. This activity only reinforces and increases the state's GIS capabilities in the area of emergency management.

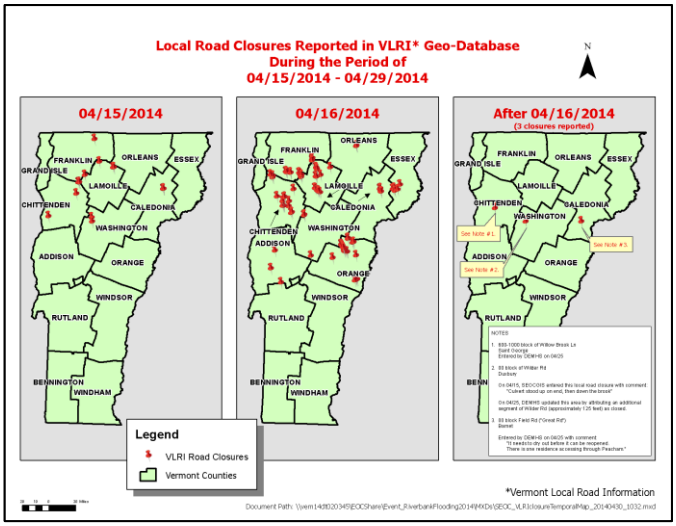
During April 2014, the SEOC was activated. VCGI provided GIS staffing to the Planning Section GIS Unit during that event. VCGI produced analytical products during the activation, including a map of locations of swift water rescue teams, supporting a common operating picture (COP).

VCGI also continues to provide day-to-day cartographic and spatial analytical services to DEMHS. VCGI provided DEMHS with maps that supported a transportation damage reporting tabletop exercise. VCGI also produced a map that depicts amounts of monetary damages by county that are required for a disaster declaration in federal fiscal year 2015; The amounts are based on a per capita county multiplier.

Vermont Local Road Information (VLRI)

On January 31, 2014, VCGI delivered an information solution for easy and efficient updating, monitoring, and disseminating hazard-related closure statuses of local roads (roads that are not maintained by VTrans). The information solution is named "VLRI" (Vermont Local Road Information). The VLRI solution is composed of a database, a map-based data-entry interface in which staff of regional planning commissions and state organizations can update closure statuses of local roads, and a data feed (web service) for disseminating VLRI data to other systems and clients.

VLRI was utilized during the flood event in April 2014. After the storm, VCGI queried the VLRI database to provide a temporal map of local road closures that were reported in VLRI during the period of April 15 through April 29. This type of map depicts the progression of an event and the geographic distribution of local road closures.

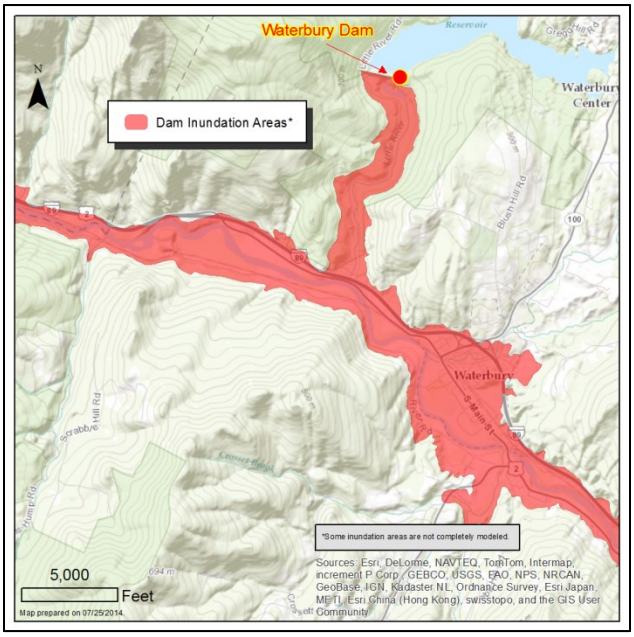


Potential enhancements to VLRI were identified during and after the April flood event. VCGI has developed a project plan for developing a new release of VLRI to include functional enhancements.

Hazard Mitigation Projects GIS Data Development

VCGI is working with DEMHS on a data development project that will map hazard mitigation project information, which is currently stored in Excel format. The new GIS data layer will support geographic visualization and analysis of hazard mitigation information. VCGI has composed a project plan for data development and data maintenance. Data modeling for the hazard mitigation project data is underway. The project plan includes development of a web map editing client that will allow the DEMHS Hazard Mitigation Team to maintain the data. The data layer will be stored in an

enterprise GIS database for use within DEMHS and provision of data to stakeholders. This project is on track toward completion in early 2015.



Dam Inundation GIS Data Development
VCGI is also working with DEMHS on a data development project for dam inundation modeling. The state's dam inundation GIS data layer on hand needs to be improved with increased coverage and currency. VCGI has collaborated with DEMHS staff to evaluate software utilities that produce dam inundation models, such as Geo Dam Breach and DSAT.

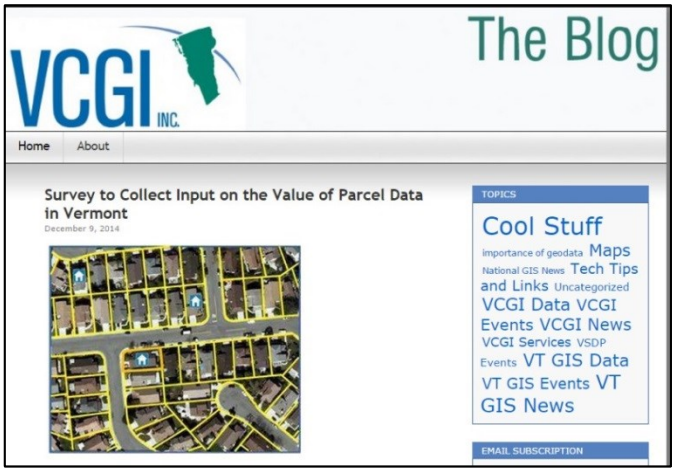
VCGI has provided DEMHS with a project plan that outlines a path toward a more complete and current dam inundation data layer. The plan includes steps for migrating existing and new dam inundation data to a new data model that is suitable to the formats of various data sources and functional uses of the data.

II. VCGI Outreach Activities

Leslie Pelch, Outreach Coordinator/Web Content Manager

VCGI has a Facebook Page: 229 people "like" VCGI on Facebook (up 41 from last year). We post information about events, data, and resources. Search for Vermont Center for Geographic Information while in Facebook to find the site.

VCGI has a Blog: Fifty three (up five from last year) active subscribers receive emails letting them know when something new is posted at this web page. We post articles about events, data, links to resources and interesting information.
http://vcgiblog.wordpress.com/



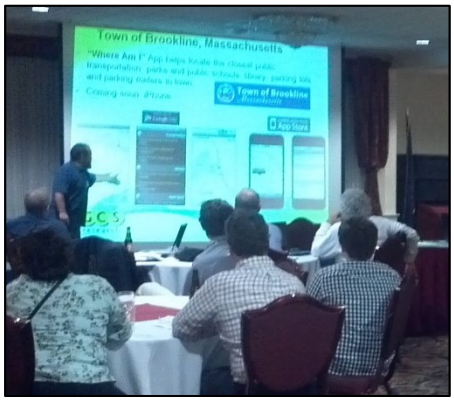
VCGI continues to have an active Email Listserv: The listserv is another venue for VCGI to provide information about data and events, but also provides a forum for 770 subscribers (up 76 from last year) to post technical questions and get quick answers.

VCGI has a Twitter Account: We have 171 followers (up 55 from last year) and a Klout of 35. VCGI tweets and retweets messages relevant to mapping and GIS in VT and beyond. **@VCGI**

VCGI has a LinkedIn company page: We have 138 followers. We post information about VCGI, GIS data, and other related information.

VCGI offers Webinars: VCGI offered 10 webinars during the fall of 2013 and plans to offer at least six more in early 2014. Around 200 people participated in webinars during the fall. Presenters include VCGI staff, private sector consultants, academic staff, and state employees. Participants include people from both the public and private sectors. VCGI has also begun providing the summer Intro to GIS training that we offer as a webinar (in addition to the live training). The webinars are free to attend and are recorded and posted at our web site.

VCGI partnered with VT Technical College to offer our own Introduction to GIS/GPS training: The trainings were offered at the VTC campuses in Williston and Randolph. 20 people participated in these trainings to learn how to use free GIS software and a handheld GPS unit.



Other Events and Activities

In addition to training and online outreach, VCGI's Outreach Coordinator organizes and participates in events and activities around the state with a variety of different interest groups.

Events and Activities VCGI Organized in 2014:

- January - March - Webinars
- January – Legislative Display on GIS/Mapping in VT in the Card Room
- May – VCGI Roundtable Conference in Colchester, various GIS topics
- July/August – Introduction to GIS/GPS 2-day trainings in 2 locations
- August through December – Webinars

Events and Activities in which VCGI Participated in 2014:

April – Town Officer's Education Conferences - three locations around the state

- June – Presented GPS workshop at "Becoming an Outdoor Family" weekend in Groton State Forest
- June – Presented GIS/GPS workshop for water/waste system professionals in partnership with the VT Rural Water Association
- September – Helped organize and present at VT Society of Land Surveyors 50th Anniversary Annual Conference.
- September – Staffed booth at VT Recreation and Parks Conference
- October – Attended and presented at Northeast Arc Users Group conference (NEARC)

- October – Staffed booth at VT League of Cities and Towns Town Fair Annual Meeting
- October - Staffed booth at Tech Jam 2014
- December – Staffed booth at VT Alliance for the Social Studies Conference
- December – Participated in national Geospatial Extension Specialists' Annual Meeting
- December – Presented at VT Society of Land Surveyors Roundtables Conference

Coordination/Strategic Activities in 2014:

- Coordinated multiple meetings to discuss future maintenance of the Conserved Lands Database (CLD). Created new conserved lands attribute schema with primary data creators/partners. VCGI staff is in the process of designing a geodatabase and data submission procedure so that CLD can be updated in 2015 and yearly thereafter!
- Helped to coordinate meetings to discuss statewide parcel data creation/improvement. Led to creation of EGC Parcel Data Workgroup which will propose a long-term parcel improvement and maintenance program for the state in 2015. Worked with VTrans contractor (AppGeo) to help design and promote survey of parcel data users and will continue to help with that project to develop parcel data Return on Investment report and Parcel Lifecycle report.
- Received extension to grant from Northern Borders Regional Commission to create/improve parcel data for selected towns in the six northern counties in partnership with three northern RPCs. Up to twenty towns will be supported via this program, which will conclude at the end of 2015.
- Helped Jarlath O'Neil-Dunne (UVM), coordinator of VT View, organize a Remote Sensing workshop held in June.
- Participated in VT Society of Land Surveyors Program Committee Meetings throughout year, and helped ensure inclusion of GIS-related sessions at Annual Conference and Roundtable Meetings.
- Started discussion with State Archivist about partnering with VT State Archives and Records Administration to submit a joint grant proposal to the National Historic Publications and Records Commission. We put this idea on hold due to VCGI's immanent move to ACCD, but plan to reconsider it next year.

III. VCGI Business Review

Audit

Johnson Lambert LLP performed the yearly independent audit of VCGI's financial information. No material weaknesses or significant deficiencies were found. A full copy of the entire audit report including the Financial Statements and Supplementary Information, Management Letter and Compliance Reports is available from VCGI; contact David Brotzman, Executive Director.

Board of Directors

Melissa Prindiville was elected Secretary/Treasurer of the VCGI Board of Directors.

II. VGIS – 2014 Geospatial Data Activities

VCGI's 2014 Annual Report provides the Governor, the Vermont General Assembly, and our citizens with information about Vermont's steady progress in building a high quality Vermont Spatial Data Infrastructure. This section of the Annual Report provides a status of several of the most active or most demanded statewide data acquisition efforts during 2014.

a. Vermont Imagery Program

The statewide orthophoto imagery is made available free to the RPCs, and Towns in uncompressed format. The public has access to the same data in compressed format through VCGI's free data download capability and anyone may purchase the data in uncompressed format on a hard drive from VCGI.

Color and infrared orthoimagery was successfully acquired in the spring of 2014 over Essex, Orange, and Orleans county areas. The yearly statewide 50 cm. data collection is completed and will be available for distribution in January of 2015.

Planning for the spring 2015 acquisition in the Bennington and Windham section of the state has already started. There are no "Buy-Up" or higher resolution acquisitions planned in those areas.

The matrix below shows the vintages of the statewide orthophotos acquisition areas by county. However, the production area does not align with county boundaries. The names generally designate a general region and not a complete county coverage. All counties are completely covered by the end of the five year acquisition period.

County	Vintage #1	Vintage #2	Vintage #3	Vintage #4	Vintage #5	Latest Update
Addison	1978	1995	2006	2012		Completed
Bennington	1974	1992	2000	2010	2015	Scheduled
Caledonia	1982	1999	2006	2012		Completed
Chittenden	1978	1988	1999	2007	2013	Completed
Essex	1982	1999	2009	2014		Completed
Franklin	1978	1995	2008	2013		Completed
Grand Isle	1978	1995	2008	2013		Completed
Lamoille	1979	1996	2007	2013		Completed
Orange	1979	1998	2006	2014		Completed
Orleans	1982	1999	2008	2014		Completed
Rutland	1975	1994	2006	2011		Completed
Washington	1979	1996	2006	2012		Completed
Windham	1974	1989	2000	2010	2015	Scheduled
Windsor	1975	1994	2006	2011		Completed

VCGI manages the VT statewide orthoimagery program, which includes acquisition of the imagery, quality control and dissemination of the imagery. The RPC's have volunteered to work closely with their member towns to provide the orthophotography in hard copy, as per both statute and need, while the State Archivist provides access to all historical hard copy orthophotography.

b. Cadastral or Parcel Data – Contributed by Leslie Pelch, VCGI

In 1988, Vermont's five-year GIS Plan identified digital municipal parcel boundaries as a fundamental need to support town planning and development. Since that time dozens of towns have invested in high quality parcel maps over the years, and state funding (1989-91) supported conversion of existing paper property maps into digital data. Digital parcel data help municipal officials to perform a more accurate property tax assessment. Towns link the parcel data to their Grand Lists and then are able to have detailed tax information. Municipal tax officials, realtors, planners, and property developers use this data to show taxpayers how proposed development or changes in municipal services and regulations will affect them. In many towns, parcel data helps to assure fair tax distribution, plan services, provide public notices, and many other municipal functions.

Only about 30 of VT's 255 towns do not have any digital parcel data. VCGI distributes data for 186 of the towns that do have it, although that data varies quite a bit in terms of age and quality. We hope to increase the number of towns participating in our data distribution process in 2015.

Northern Borders Regional Commission Parcel Project

VCGI, in partnership with the northern border regional planning commissions, was successful in obtaining a grant from the Northern Border Region Commission to develop digital parcel data in FY14. This project proposes to increase the parcel data infrastructure in the northern border region in four ways:

1. Provide educational opportunities to all towns in the region so that they can learn about the importance of parcel data and best practices for hiring a contractor to create or update parcel data so that it meets or exceeds the recently created VT GIS Parcel Data Standard.
2. Provide funds to towns that apply and are chosen to receive them in order to mitigate the cost of the initial creation of parcel data or in order to bring their existing data up to the level of the state standard. These funds would be paid to mapping consultants.
3. Provide direct technical support to towns that are chosen to receive funds to guide them through the process of developing specifications, drafting a request for proposals (RFP), reviewing proposals, and drafting a contract.
4. Provide direct technical support to towns that are chosen to receive funds to help them develop a sustainable maintenance plan for their parcel data, whether on an annual or less frequent basis.

This project can serve as a prototype for a future statewide digital parcel data project. This project will also support the ongoing sustainability of the parcel data created, because the participating towns will increase their internal capacity to deal with parcel updates, and will develop plans for how those updates will be funded.

Fourteen towns were chosen to receive funding to support parcel mapping in 2014. Ten of those towns will have completed their projects by February of 2015. The remaining four will complete their projects by the end of 2015. In addition, at least four more towns will be funded to complete parcel mapping projects in 2015.

Partners:

Each Regional Planning Commission has at least one staff member who serves as a GIS specialist/planner. This mapping expert serves as technical support to the municipalities who participate in this project. The Outreach Coordinator at the VT Center for Geographic Information

serves as project manager and education lead. The RPC GIS Specialists and VCGI's Outreach Coordinator will also work together as a steering committee.

- Vermont Center for Geographic Information (VCGI)
- Northwest Regional Planning Commission (NRPC)
- Northeast Vermont Development Association (NVDA)
- Lamoille County Planning Commission (LCPC)

Statewide Parcel Data Workgroup

There is a growing interest in having a statewide parcel database. In 2014, a group of several agencies interested in statewide parcel data began meeting to coordinate a statewide digital parcel data effort. VTrans, ACCD, ANR, Dept. of Taxes, RPCs and several other agencies have voiced strong support for such an effort. There are a lot of financial, operational and political considerations that need to be considered. Clear expectations need to be developed as well as determining the role of each data user and contributor organization. The current plan is to begin the discussion about any statewide digital parcel effort in the FY2015 legislature. With the involvement of several agencies there is a real chance there will be significant movement toward creating the first iteration of a statewide digital parcel dataset in Vermont.

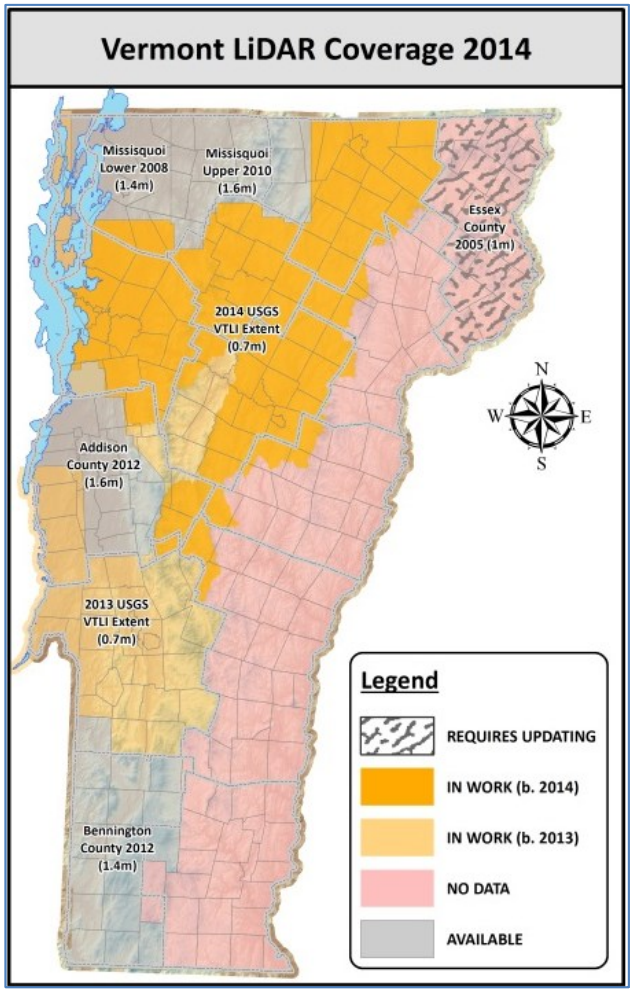
Late in 2014, VTrans hired AppGeo, a private contractor to begin project to develop a Return on Investment Study as well as a Parcel Lifecycle Report. The process leading to these documents will include an online survey, three workshops, and in depth interviews with stakeholders. Final products are expected to be delivered in spring of 2015. These documents will be invaluable in the discussion about the value of statewide parcel data as well as the mechanisms we should pursue to create a sustainable statewide data development ad maintenance system.

c. High Resolution Elevation Data – Contributed by Mike Brouillette, VCGI

Elevation data in Vermont consists of Digital Elevation Model (DEM) data and land contour information. DEM data provided by the USGS at 10m resolution has been distributed by VCGI for years with derived contours used to show general topography. The 2011 flooding and destruction from Tropical Storm Irene emphasized the impact of states inadequate DEM and following the event FEMA recommended that Vermont acquire a high-resolution elevation model in order to support future hazard mitigation efforts. The emergency and public safety community and a broad range of other critical state interests have identified a statewide high resolution DEM as a significant need. The most effective means of acquiring this data is through airborne Light Detection and Ranging (LiDAR).

In the past year a collaboration of state and federal partners succeeded in securing an additional 2500 square miles of LiDAR coverage, reducing the estimated cost of outstanding "no data" areas from $2.1 to $1.2 million under current conditions. This cost includes the storage and distribution of LiDAR and derivative products for the state according to the specifications most useful to the user community. A multi-year phased approach affords contributing entities the ability to budget in advance and ensures a broader coalition. Coverage priorities were assigned by weighting the need and size of population served for lake shore protection, flood plain mapping and emergency management and public safety efforts. Other factors may change the prioritization of collection area needs.

The cost of statewide LiDAR is primarily dependent upon the product specifications (i.e. accuracy, post spacing), the types of derivative products that are requested (i.e. contours, hydro-enforced DEM), and the size of the project. Cost and accuracy are further determined in Vermont by the terrain and tree cover of the collection area. Utilizing the NDEP Quality Level 2 "QL2" product specification on all future projects will ensure alignment and consistency with current projects at a horizontal point spacing of 0.7m and vertical accuracy of 9.25cm.



The "raw" LiDAR elevation point data consists of millions (possibly billions) of points and is of relatively limited use to the community without the derivative products created from the source data. The vast majority of agencies, towns, organizations and businesses that need LiDAR data require the derivative products to do the work they want to do.

Historically, there have been partnerships of funding organizations that have come together to provide the necessary funding for regional LiDAR acquisition projects in the state. Past funding sources for regional LiDAR projects have been FEMA, USGS, USDA, VTrans, ANR, LCBP, CCRPC and MPO, This model of partnership funding will almost certainly continue. However, none of the partners listed has the funding to be the primary contributor to a project of this size. If a primary funding contributor can be established, history has shown other partners will come forward to provide additional funding.

Existing LiDAR coverage exists within Vermont in Addison, Bennington and Essex Counties and most of the Missisquoi subbasin. Rutland County and all of the Little and Mad River watersheds is currently being processed while data capture efforts for Chittenden, Lamoille, Orleans and the outstanding areas of Washington County are in progress. Final project coverage area plans would ideally be delineated by watershed with consideration given to both stakeholder priorities and the most effective field data collection approach. "

Elevation data in Vermont now includes Aspect, 2' Contours, Digital Surface Model (DSM), DEMs, Hillshade, height of features known as "normalized" DSM (nDSM) and Slope information. The new data derivative products are a result of the Vermont LiDAR Initiative effort formalized in 2013 by VCGI and its EGC partners. These efforts will in turn, facilitate the environmental, public safety, regional planning and other efforts in Vermont that require more accurate information to support both cartographic and analytical purposes.

Status: 1.0, 1.4 and 1.6 meter resolution LiDAR based data is now available on the VGIS for Addison, Bennington and Essex Counties and the Missisquoi subbasin (most of Franklin County). Higher accuracy, "QL2" 0.7 meter resolution data, was acquired in both spring and fall 2014 for Rutland County, the rest of Grand Isle County, the Mad River Valley and the Waterbury floodplain with results available by 2015. The only statewide elevation data remains the USGS 10 meter elevation data and its 20' contour derivative, integrated in 2012.

VCGI provides the following elevations data products to the public:

- Vermont LiDAR Initiative
    - ElevationDEM_DEM1m 1 meter Digital Elevation Model (DEM)
    - ElevationDEM_DEM1p4m 1.4 meter Digital Elevation Model (DEM)
    - ElevationDEM_DEM1p6m 1.6 meter Digital Elevation Model (DEM)
    - ElevationDEM_DEM24 USGS National Elevation Dataset (NED) 30 meter DEM
    - ElevationOther_ASPECT1m 1 meter ASPECT
    - ElevationOther_ASPECT1p4m 1.4 meter ASPECT
    - ElevationOther_ASPECT1p6m 1.6 meter ASPECT
    - ElevationOther_DSM1m 1 meter Digital Surface Model (DSM)
    - ElevationOther_DSM1p4m 1.4 meter Digital Surface Model (DSM)
    - ElevationOther_DSM1p6m 1.6 meter Digital Surface Model (DSM)
    - ElevationOther_HILSHD1m 1 meter HILLSHADE
    - ElevationOther_HILSHD1p4m 1.4 meter HILLSHADE
    - ElevationOther_HILSHD1p6m 1.6 meter HILLSHADE
    - ElevationOther_nDSM1m 1 meter nDSM (Normalized DSM)
    - ElevationOther_nDSM1p4m 1.4 meter nDSM (Normalized DSM)
    - ElevationOther_nDSM1p6m 1.6 meter nDSM (Normalized DSM)
    - ElevationContours_CN2T
    - ALL-LDR Product - All available LiDAR

- USGS DEM
    - ElevationDEM_DEM10m - 10 meter DEM
    - ElevationContours_CN20T - 20ft contours

d. Critical Facilities Data – Contributed by Ivan Brown, VCGI

During 2014, VCGI continued collaboration with DEMHS, the Regional Planning Commissions, the Vermont Enhanced 9-1-1 Board (E911), and VDH to design and implement a modern data collection system for efficient and secure collection of high quality critical facility data into a centralized GIS database. A data migration project for relating critical facility locations to E911 address point data continued into 2014, moving the critical facilities data model closer to alignment with business needs. That data migration was made possible with a secure web mapping editor named *Critical Facilities Data Collector*. During February 2014, a public water supply data layer from the Vermont Agency of Natural Resources was added to the Critical Facilities Data Collector for improvement to the accuracy of critical facility data points which model water supply infrastructure.

Meanwhile, DEMHS staff has been conducting a sector-by-sector analysis of the state's critical infrastructure in order to determine the data elements that are needed for provision of state-level overviews on the status of critical infrastructure. The data elements are undergoing categorization by sixteen sector types. The resulting taxonomy of critical infrastructure will be applied to development of a new data model for the more detailed critical facilities GIS database; The critical facilities GIS database will continue to be maintained through a secure web mapping editor.

The critical facilities GIS database is needed for efficient dissemination of current critical facility data to consumers of that data through appropriate filters (confidential vs. public) and data formats. VCGI is providing a leadership role to this effort. A well-organized and centralized critical facilities database will

be a valuable resource to the process of risk assessment, sector-specific planning, and dynamic hazard analysis.

e. Conserved Lands – Contributed by Leslie Pelch, VCGI

Representatives from the VT Land Trust, The Nature Conservancy, Green Mountain National Forest, VHCB, VT Agency of Natural Resources, VCGI and the UVM Spatial Analysis Lab have all been engaged in an effort to update the attribute schema of the Conserved Lands database in preparation for development of a coordinated procedure (hosted by VCGI) to update the data on an annual basis. The group has finished updating the data schema to current standards with clarification of the attribute values. VCGI staff is currently in the process of designing a geodatabase and data update procedure for approval by the group. The data creators listed above have agreed to provide the data in a format that meets the schema they have all worked on developing, so that the actual compilation will be as easy as possible for VCGI. This effort should result in an update to the Conserved Lands Database by the end of 2015. The last update was made in 2009.

The value in this effort is that all of the data creators benefit from the data provided by the others, the organizations wish to avoid data distribution overhead and all of the data is available from a single location. As a result, it is worth their while to contribute their section of the data to VCGI to distribute. Other users of the data include land managers around the state and land use planners.

III. VCGI's Vision, Mission Statement and Strategic Plan

a. Organization

In January 1992, Governor Howard Dean, M.D. issued an executive order establishing VCGI as a non-profit corporation under the authority of a Board of Directors. The Board includes twelve directors appointed for two-year terms to represent state agencies, regional planning commissions, local government, higher education, private sector and both chambers of the Vermont General Assembly. The Board has the responsibility for general management of and authority over the property, business and affairs of the center.

VCGI is located in Waterbury, VT. It is currently staffed by six full-time employees, a part-time GIS Technician and an independent contractor that performs the duties of business manager.

b. Vision

VCGI is the nexus of GIS in the VT GIS Community.

c. Mission Statement

Vermont Center for Geographic Information, Inc. (VCGI) will deliver high quality geospatial data, standards, services, solutions and information to our customers and stakeholders using methods that are innovative, client-focused and consistent with our enabling legislation.

VCGI will provide strategic leadership and promote awareness and open communication in support of the VT GIS community.

VCGI will establish the infrastructure necessary to support financially responsible business activities and challenge all employees in an engaging and supportive environment.

d. Strategic Plan 2012 -2015

Strategic Objectives
Objective 1
1.0 VCGI is the recognized clearinghouse for GIS data in the state.

1.1. Activity - Improve data warehouse architecture.
Metric - Monitor percent complete and survey feedback.

1.2. Activity - Improve marketing of our capabilities.
Metric - Monitor web stats.

1.3. Activity - Make it easier to use the warehouse for publishers and consumers.
Metric - Monitor web stats of consumers.
Metric - Track submissions and updates of publishers.

1.4 Activity - Assist consumers and publishers using the clearinghouse.
Metric - Use of customer surveys.

1.5 Activity - Improve turnaround time for release of new updated data and services.
Metric - Monitor and measure turnaround on data and services.

1.6 Activity - Become best and most useful data portal solution.
Metric - Monitor web stats.
Metric - Use of customer surveys.

1.7 Activity - Expand warehouse to include web service.
Metric - Monitor percent complete.

1.8 Activity – Provide data and web service hosting options to EGC partners.
Metric – Publish and maintain data and web service hosting offerings that are used by 1 or more EGC partners

Objective 2

2.0 VCGI is the foundation of GIS activity in the state

2.1 Activity – Become a recognized GIS policy resource in the state.
Metric - Increased involvement with legislative activities and administrative task forces and groups.

2.2 Activity – Provide primary support to EGC & Enterprise GIS initiatives
Metric – Measure completion of tasks in the EGC strategic plan

2.3. Activity - Market VCGI role as state GIS Coordinator
Metric - Monitoring level of involvement with legislature and administrative initiatives

2.4 Activity - Build & maintain relationships with GIS partners & identify important committees
Metric – Increased involvement with GIS partners and important committees.

2.5 Activity - Advocate for geospatial leadership position w/CIO
Metric - Established and recognized position created at the state level

Objective 3

3.0 VCGI uses all avenues available to effectively communicate relevant geospatial information

3.1 Activity – Make outreach a shared responsibility
Metric - Monitor contributions by staff members to outreach efforts.

3.2 Activity – Develop and implement an outreach and marketing plan
Metric – Plan has been drafted, approved and implemented.
Metric - Conduct comprehensive reevaluation of VCGI's Outreach/feedback/solicitation efforts and report findings to group for action.

3.3. Activity - Make outreach a shared responsibility
Metric - Monitor contributions by staff members to outreach efforts focused on GIS and IT trends..

3.4 Activity - Develop and implement an outreach and marketing plan
Metric – Plan has been drafted, approved and implemented.

3.5 Activity - Improve marketing of VCGI capabilities and services to state government
Metric – Develop a State Marketing Plan

3.6 Activity - Establish support mechanism(s), e.g., help desk.
Metric - Help desk or other mechanism has been established and customers are aware of it.

Objective 4

4.0 VCGI has extensive and forward looking geospatial expertise

4.1 Activity – Employees devote time to learning more to keep our expertise current, e.g., training.
Metric - Employees attend at least one training each year.

4.2 Activity – Cross Train Employees
Metric – Primary and secondary POC for each technical role supported by sufficient skills to execute roll.

4.3. Activity - GISP certification for technical staff
Metric - Technical staff maintain GISP certification

4.4 Activity - Maintain awareness of GIS and IT trends relevant to users
Metric – Level of staff contribution to outreach efforts focused on GIS and IT trends.

4.5 Activity – Professional Involvement
Metric - Track professional involvement by staff

Objective 5

5.0 We are proud to be part of this organization

5.1 Activity – Pursue team building opportunities
Metric - One team building opportunity per year.

5.2 Activity – Customers are satisfied with products and services
Metric – 50% or more of all feedback is at level "highly satisfied" or greater.

5.3. Activity - Motivated and engaged staff pursuing the organizational mission
Metric - One or more innovative solutions per year
Metric - Performance based compensation

5.4 Activity - Staff engaged in decision making
Metric – Regular staff meetings
Metric - One or more staff present at every board meeting

Objective 6

6.0 We anticipate the needs of our clients, transforming them into opportunities

6.1 Activity – National, regional and state community involvement
Metric - Engaged in professional activities identified by GISP ongoing certification

6.2 Activity – Research and identify the needs of our customers
Metric – Customer survey provides clearly identified needs
Metric - One-on-one meetings with key constituents, e.g., EGC partners
Metric - Outreach coordinator identifies needs at outreach events

6.3. Activity - Research and testing of new and/or promising solutions
Metric - Quarterly internal presentations on new and promising solutions

6.4 Activity - Integrate emerging solutions with customer needs
Metric – Implement one or more new solutions per year
Metric – Each employee presents on one or more new solutions at staff over the course of a year.

6.5. Activity - Identify priorities for an annual Work Plan
Metric - Integrate one or more priorities into an annual Work Plan

Objective 7

7.0 Our clients are highly satisfied with our products and services.

7.1 Activity – Conduct exit interviews and/or satisfaction surveys with project clients
Metric - Receive greater than 50% "highly satisfied" response.

7.2 Activity – Continue outreach surveys (for issues "actionable" by VCGI)
Metric – 50% or more of all feedback is of level "highly satisfied" or greater.

7.3. Activity - Integrate customer feedback into improving products and service(s)
Metric - Document and track feedback and action.

- # IV. Financial Overview

Act 204 of 1994 (10 VSA Chapter 8) calls for the development of a comprehensive GIS strategy for Vermont, and established the Vermont Center for Geographic Information, Inc.

§ 122. VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INCORPORATED; ESTABLISHMENT

(a) The State of Vermont shall support a comprehensive strategy for the development and use of a geographic information system. . .

In order to develop and implement that strategy, and to ensure that all data gathered by state agencies that is relevant to the VGIS shall be in a form that is compatible with, useful to, and shared with that geographic information system, there is hereby established a nonprofit public corporation to be known as the Vermont center for geographic information, hereinafter called the center, as a body corporate and politic and a public instrumentality of the state.

§ 126. REPORTS AND AUDITS

On or before January 15 of each year, the center shall prepare and submit to the governor a three-year work plan which describes the goals, objectives and activities of the center and cooperating state agencies and other public and private organizations. The plan also should include estimated cost of each major activity of the center, and a report concerning data gathered, documents generated, and problems and opportunities for use of VGIS information.

10 VSA 126 require that *"The books of account of the center shall be audited annually and a report filed with the secretary of administration not later than October first of each year."*

A full set of the Financial Statements are available from VCGI, contact David Brotzman, Executive Director.

VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INC.

STATEMENTS OF ACTIVITIES

FOR THE YEARS ENDED JUNE 30, 2014 AND 2013

REVENUE	2014	2013
State of Vermont grant	$378,700	$378,700
Project income	$796,984	$719,498
Imagery program income	$4,515	$5,085
Interest and miscellaneous income	$3,525	$7,748
Annual Conference income	$725	-
TOTAL REVENUE	$1,184,449	$1,111,031
DIRECT COSTS		
Direct Labor	$259,501	$272,143
Payroll taxes and employee benefits	$111,843	$108,806
Subcontract costs	$529,163	$306,661
Costs of projects and reproductions	$23,176	$44,269
Cost of imagery program	$7,173	$3,014
Cost of outreach program	$12,063	$13,051
TOTAL DIRECT COSTS	$942,919	$747,944
OPERATING EXPENSES		
Indirect salaries and wages	$121,563	$110,203
Payroll taxes and employee benefits	$52,366	$45,476
Rent	$31,404	$30,789
Depreciation	$17,756	$16,308
Loss on disposal of fixed assets	-	$2,913
Computer support and maintenance	$11,976	$14,799
Professional Fees	$55,559	$60,279
Travel and Training	$5,583	$8,566
Office Expense	$10,646	$13,970
Utility Expense	$1,963	$1,842
Insurance	$4,166	$3,945
Miscellaneous	$407	$1,306
Telephone Expense	$3,367	$3,485
TOTAL OPERATING EXPENSES	$316,756	$313,881
TOTAL DIRECT & OPERATING EXPENSES	$1,259,675	$1,061,825
CHANGE IN NET ASSETS	($75,226)	$49,206

Unaudited Financial Statements

VERMONT CENTER FOR GEOGRAPHIC INFORMATION, INC.

STATEMENTS OF FINANCIAL POSITION
JUNE 30, 2014 AND 2013

ASSETS	2014	2013
CURRENT ASSETS		
Cash - undesignated	$150,863	$192,522
- capital reserve	$30,000	$30,000
Certificate of deposit	-	$175,000
Accounts receivable	$16,757	$29,907
Unbilled receivable	$18,074	$15,157
Prepaid expenses	$11,825	$10,088
TOTAL CURRENT ASSETS	$227,519	$452,674
PROPERTY AND EQUIPMENT, NET	$20,969	$33,689
TOTAL ASSETS	$248,488	$486,363
LIABILITIES AND NET ASSETS		
CURRENT LIABILITIES		
Accounts payable	$1,437	$89,088
Accrued expenses	$21,684	$17,987
Accrued wages	$16,761	$16,902
Accrued vacation	$10,796	$11,045
Funds held – VT Orthophoto Buy-Up Program	$379	$78,684
Deferred project income	-	-
TOTAL CURRENT LIABILITIES	$51,057	$213,706
NET ASSETS		
Unrestricted - Board designated for capital reserve	$30,000	$30,000
Unrestricted - Undesignated	$167,431	$242,657
TOTAL NET ASSETS	$197,431	$272,657
TOTAL LIABILITIES AND NET ASSETS	$248,488	$486,363

Unaudited Financial Statements


data
Vermont
VCGI
GIS
state
State
available
information
support
services
imagery
Information
Data
efforts
maintenance
NHD
digital
EGC
USGS
development
Town
service
resources
stations
Project
System
Vermont's
Agency
network
including
emergency
staff
website
supporting
E911
activities
ArcGIS
VTrans
training
boundaries
locations
7/18/2011
layers
Regional
Completed
Center
center
people
collection
currently
long
help
partners
technology
effort
Outreach
project
using
road
statewide
agencies
areas
needs
web
used
new
hardware
public
updated
include
community
years
year
town
Plan
many
planning
events
layer
Enterprise
VT
VGIS
acquisition
soil
made
CORS
scale
New
School
Land
Manager
Status
map
VCGI's
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January
regional
continues
work
report
well
use
provided
private
EmergencyE911
important
orthophotography
storage
free
two
Broadband
necessary
geospatial
access
also
Activities
local
site
Business
Geographic
parcel
completed
spatial
land
develop
mapping
several
provides
GPS
need
Transportation
National
high
offer
early
maps
entire
maintain
full
system
County
Mapping
Report
possible
Irene
provide
government
towns
resolution
quality